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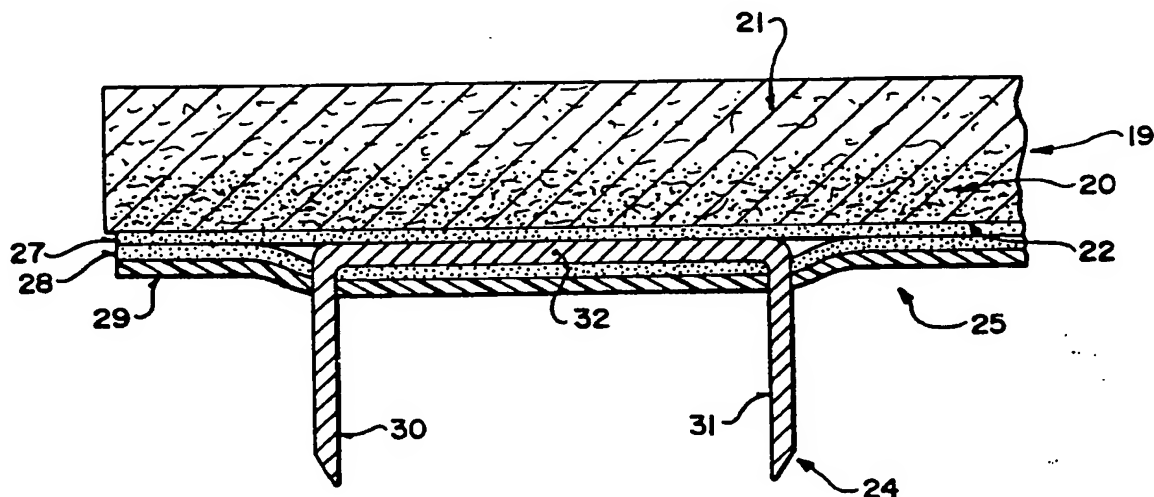
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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/CA90/00067 (22) International Filing Date: 27 February 1990 (27.02.90) (30) Priority data: <table border="0"> <tr> <td>8904538.9</td> <td>28 February 1989 (28.02.89)</td> <td>GB</td> </tr> <tr> <td>8908824.9</td> <td>19 April 1989 (19.04.89)</td> <td>GB</td> </tr> <tr> <td>8919101.9</td> <td>22 August 1989 (22.08.89)</td> <td>GB</td> </tr> <tr> <td>454,640</td> <td>21 December 1989 (21.12.89)</td> <td>US</td> </tr> </table> (71)(72) Applicants and Inventors: O'CONNOR, Lawrence, J. [CA/CA]; 6025 Southboine Drive, Winnipeg, Manitoba R3R 0B5 (CA). O'CONNOR, Christopher, Douglas [CA/CA]; 267 Canora Street, Winnipeg, Manitoba (CA). O'CONNOR, Timothy, A. [CA/CA]; 6025 Southboine Drive, Winnipeg, Manitoba R3R 0B5 (CA).		8904538.9	28 February 1989 (28.02.89)	GB	8908824.9	19 April 1989 (19.04.89)	GB	8919101.9	22 August 1989 (22.08.89)	GB	454,640	21 December 1989 (21.12.89)	US	(74) Agent: ADE & COMPANY; 1700-360 Main Street, Winnipeg, Manitoba R3C 3Z3 (CA). (81) Designated States: AT (European patent), AU, BB, BE (European patent), BR, CA, CH (European patent), DE (European patent), DK (European patent), ES (European patent), FI, FR (European patent), GB (European patent), IT (European patent), JP, LU (European patent), MC, NL (European patent), NO, SE (European patent). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>
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(54) Title: FLOOR COVERING ELEMENT**(57) Abstract**

A floor covering element designed particularly for attachment to a decking plank comprises a narrow strip (19) of a textile carpet material. Needle punch material is preferred in view of its stability. The needle punch material carries a plurality of staples (24) at the side edges of the strip arranged transverse to the length of the strip and carried by a layer of adhesive film (27, 28, 29) through which the prongs of the staples project for engagement with the wooden surface of the plank (14).

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FLOOR COVERING ELEMENT

This invention relates to a floor covering element arranged for attachment to a floor surface which is particularly but not exclusively designed for use with decking planks so as to provide a decking structure which is attractive in appearance, resistant to deterioration, safe to walk on and pleasant to the touch.

Decking for docks or other outdoor situations are generally formed from wooden planks which are laid over suitable wooden structural supports and nailed into place. Such wooden decking is prone to deterioration by rotting of the wood planks, is generally rough and unpleasant to the touch when dry, very slippery when wet and can cause dangerous slivers. The planks are generally formed in narrow width of the order of four to eight inches leaving significant spaces between to allow rain water to drain from the upper surfaces.

Rotting of the planks may be reduced by the introduction of various preservatives by a pressure treatment which has become widely used. Such pressure treatment is relatively expensive and in addition can be environmentally hazardous in that the chemicals used can be dangerous to the health.

The preservatives do not however improve the

quality of the top surface of the board and this will shrink and develop cracks shortly after installation. This leaves a surface which is dangerous to walk upon especially in bare feet as boards of this type are generally used to make decks for recreational use.

Carpet is normally attached to the supporting flooring simply by laying the main body of the carpet across the floor and then by attaching the carpet to nailed strips known as "smooth edge" around the periphery of the area to be covered. In other cases carpet tacks are available with a relatively large head and sharp point which are hammered through the carpet so the head engages the backing of the carpet and is hidden by the tufts with the pointed portion engaging into the underlying surface which is generally wood.

Many carpets and carpet like materials are available for use outdoors. The tufted type of carpet which has a separate backing and tufts inserted through the backing is often attached by the conventional carpet tacks or staples.

An alternative form of outdoor carpet has recently become available which is a non-woven, non-tufted product formed from carded fibres which are bonded together and needle punched to form a tufted appearance

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of the upper surface. This type of product is relatively dense and does not have any separate backing and accordingly it is free from tuft lines or grain and hence can be easily cut. It is difficult to attach this type of material, however, in view of the fact that mechanical fasteners cannot be readily buried in the fibres in view of the very short tuft length and the thick backing.

Carpet in relatively wide widths is basically very stable and requires very little attachment. Even carpet tiles remain basically stable in position in view of the cooperation between each tile and the next adjacent tiles. Some adhesive can be used in relation to carpet tiles in some cases although this is not always necessary.

However simply applying a wide width of an outdoor carpet over a decking is generally unsatisfactory in that the carpet sags into the spaces between the decking planks leaving an unattractive grooved appearance and in addition the carpet may interfere with the proper drainage of water between the planks which is necessary to avoid water collection on the surface.

It is one object of the present invention, therefore to provide an improved floor covering element which can be readily attached to a sub floor of wood or

other penetrable material.

It is a further object of the present invention to provide an improved floor covering element which can be readily attached to a decking plank to provide an improved appearance and surface characteristics of the decking plank.

It is a further object of the present invention to provide an improved decking material in the form of a combination of a decking plank which carries thereon a floor covering material of a width suitable to cover the upper surface of the decking plank.

According to a first aspect of the invention there is provided a floor covering element comprising a layer of a floor covering material having an upper surface defining a suitable surface for receiving the feet of a person walking on the element and a lower surface for resting on a support surface, characterized in that there is provided a plurality of mechanical fastener members each having a head portion attached to and carried by the floor covering material prior to the attachment thereof to the support surface projecting downwardly therefrom for penetration into the support surface.

According to a second aspect of the invention

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there is provided a floor covering element for use with a decking plank characterized in that it comprises an elongate narrow strip of a floor covering material having a width substantially equal to a width of the plank, and means carried by the strip for attachment of the strip to the plank.

According to a third aspect of the invention there is provided a combination of a decking plank and a floor covering material thereon, the combination comprising an elongate plank of a wooden material of generally rectangular cross section including two wider sides and two narrower sides, an elongate strip of floor covering material, and means fastening the floor covering material to one wider side of the plank such that the floor covering material covers said one wider side with at least a portion thereof lying in a plane of said one wide side, the other of said wider sides being free from said floor covering material, characterized in that said portion of the floor covering material lying in the plane of said one wider side terminates substantially at side edges of said one wider side of the plank.

Preferably each mechanical fastener comprises a staple with an elongate head portion of the staple and a pair of downwardly extending legs which can engage into

the surface of the decking plank or other subfloor structure. Preferably the legs of the staple protrude through a layer of a film material which is adhesively attached to the undersurface of the floor covering material. In a particularly preferred arrangement, the head of the staple is received between an upper layer of the adhesive film material and a lower layer of the adhesive film material with the legs of the staple projecting through the lower layer.

The construction defined above has the advantage that the staple or other mechanical fastening element can be readily attached to the floor covering layer and is maintained fixedly attached to the floor covering material and prevented from twisting, from becoming loose and from being driven upwardly through the floor covering material.

One embodiment of the invention is herein described by reference to the accompanying drawings in which:

Figure 1 is an isometric view of a portion of decking including a floor covering element according to the present invention.

Figure 2 is a transverse cross-sectional view through one decking plank according to the invention.

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Figure 3 is a cross-sectional view similar to that of Figure 2 on a significantly increased scale showing the floor covering element prior to attachment to a decking plank.

Figure 4 is an underside view of the floor covering element portion of Figure 3.

In Figure 1 there is shown a decking construction comprising a pair of timber support beams 10 and 11 together with a plurality of decking planks 12, 13 and 14. The conventional planks are indicated at 12 and 13 and the plank including a floor covering element according to the invention is indicated at 14.

The plank comprises an elongate plank of wood with a rectangular cross-section as best shown in Figure 2 with two wider sides 15 and 16 and two narrower sides 17 and 18. The plank is laid across the beam 10 and 11 and nailed into place in conventional manner.

On the upper surface which is the wider side 16 there is attached a floor covering material indicated at 19. The floor covering material can be of any suitable type including the conventional tufted carpet construction which includes a preformed backing layer through which is applied a plurality of tufts with ends of the tufts upstanding from the backing layer to provide a

surface on which the user walks. In most cases the undersurface of the backing layer is sealed by a covering layer. This type of construction is well known and conventional and can be used in the present invention.

Preferably, however, the material of the present invention comprises a carded material of staple fibres with the material being laid in layers including a filler or adhesive material in lower layers following which the material is needle punched to connect the layers and to provide an upper surface of the material which has the appearance of upwardly projecting tufts with grooves between the tufts. Again this type of construction is a conventional construction and is known in the trade as "needle punched". The fibres are often polypropylene fibres which are inexpensive and can be readily formed into the carded layers but these fibres have a low resistance to heat application and can be damaged at temperatures as low as 250° F.

This material is well known as outdoor carpeting and is resistant to damage from wetting and UY. Generally the material does not use or require an additional backing layer and conventionally the undersurface formed by the bonded adhesive material and the fibres is laid directly upon a supporting floor structure. The

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material has the advantage that it can be cut in substantially any direction without any grain which interferes with the direction of cut. The conventional tufted structure often has the difficulty that if the cut does not exactly follow the lines of the tufts or the weft and warp of the backing layer then the cut becomes ragged and uneven. The above material does not suffer from these problems and a cut can be formed in a straight line leaving an even stable structure at the edge.

The floor covering material is cut into strips of a width substantially equal to that of the planks concerned which can be of the order four to eight inches. The strip is then attached to the plank as shown in Figures 1 and 2 in a manner as described hereinafter. This provides an attractive appearance and a surface which is more suitable to touch and to prevent slivers, does not require painting or other coating, and does not become slippery when wet. The textile fibres of the upper surface floor covering material are hard wearing and resistant to water damage. The fabric is of a characteristic so that it will allow water to run off and reach the spaces between the planks 13 and 14.

Turning now to Figures 3 and 4, the layer 19 is shown schematically on an enlarged scale. In the view

shown, the layer of the fibres including the adhesive material which bonds the fibres together to form the integral structure is indicated at 20 and the upper layer of fibres which simulate tufts is indicated at 21. The under surface of the floor covering material 19 is indicated at 22 and this undersurface is substantially bare defining an integral layer with substantially all fibres fully bonded into the adhesive material 20. The holes from the needle punch processing are visible at 23.

On the underside of the strip of the floor covering material 19 is attached a pair of strips each carrying a plurality of staples 24. One of the strips is visible at 25 and the other of the strips is shown only schematically in Figure 2 at 26 but is the same as the strip 25 shown in detail in Figures 3 and 4.

Each of the strips comprises three layers 27, 28 and 29 together with the plurality of spaced staples 24. Each of the layers 27, 28 and 29 is formed of a film material which has significant structural strength and hence is resistant to tearing. The layers 27 and 28 are formed from a heat actuatable adhesive material preferably an ionomer of which there are many suitable examples which are readily commercially available. The layer 29

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comprises a covering layer which can be formed of any suitable non bonding material such as paper or polyester.

The staple 24 includes a pair of legs 30 and 31 each of which is suitably sharpened to form a penetrating pointed element which can be readily inserted into the surface of the plank or other penetrable sub floor arrangement. The legs 30 and 31 are connected by a transverse head portion 32 in the conventional form of a staple.

Between the head portion 32 and the underside 22 of the layer 19 is provided the strip 27. The strips or layers 28 and 29 lie on the underside of the staple so that the legs of the staple penetrate through openings punched in the layers by the legs with the layers lying over the outer surface of the head. The layers 28 and 29 are generally transparent so that the underside of the head of the staple is visible in the underside view of Figure 4. The head of the staple is thus trapped between the adhesive layers 27 and 28 with the upper surface of the adhesive layer 27 firmly bonded to the underside of the floor covering material. The close bonding of the material around the head of the staple and the attachment of the adhesive material to the upper side of the head

and the lower side of the head prevents the staple from twisting or from being pulled out of the structure. The strength of the layer 27 prevents the head of the staple from being forced into the floor covering material 19 when force is applied to the legs of the staple to cause the penetration into the sub floor.

In manufacture of the construction shown in Figure 3, a laminate in tape width of the order of one inch comprising the layer 29 and the layer 28 is fed onto a heated roller and the staples are punched through the laminate into suitable grooves in the heated roller. The heat from the roller is sufficient to actuate the adhesive effect of the layer 28 but is insufficient to cause damage to the polypropylene fibres of the floor covering layer. The covering layer 29 lies in contact with the heated roller so that the actuation of the layer 28 does not cause bonding to the roller. The layer 27 is then laid on top of the head and exposed outer surface of the layer 28 from a separate supply. The combined adhesive strip carrying the staples is then applied to the under-surface of the floor covering and suitable pressure applied by a nip roller pressing on the upper surface of the floor covering material.

The mechanical fastening elements or staples

are therefore firmly attached to the underside of the floor covering material and can be simply pressed into the sub floor and hammered into place by the necessary forces. The attachment of the staples to the floor covering material by way of the adhesive strips provides a very effective attachment. The adhesive used in the construction is fully activated and completed in its action at a time that the product is supplied to the consumer so there is no adhesive which can escape or cause any soiling of surrounding parts. The consumer is therefore involved only in the simple mechanical fastening of the floor covering element to the plank by the staples.

The staples as shown in Figures 3 and 4 are arranged so that the head extends transversely to the longitudinal axis of the strip. This enables the strip to be cut to substantially any required length without the necessity to cut through any of the staples. The strip can thus be supplied in extended length for example by rolling and the required lengths for the custom installation obtained simply by cutting from the roll. The attached strips and staples are completely flexible so that there is no problem rolling the carpet or in forming it into the required shape.

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Although shown as two separate elongate strips of attachment layers, it is possible in an alternative arrangement (not shown) to form the layers as a full width of the floor covering material to provide improved moisture impermeability. This can give improved protection to the upper surface of the plank against moisture damage. Alternatively the staples can be attached by patches of the layers with each staple substantially central of its respective patch. This can reduce the cost of the layers by eliminating those portions of the layers which are unnecessary between each staple and the next adjacent staple.

In yet further alternatives (not shown) a strip of the floor covering material can be attached solely by adhesive techniques in which the adhesive is applied directly between the upper surface of the plank and the undersurface of the floor covering.

An exposed end of the plank can be covered by a portion of the floor covering material turned down over the end of the plank as indicated at 56 in Figure 1 or alternatively a covering strip can be used for example of an extruded plastics material which clamps the end of the floor covering and ensures that it is held in place without any possibility of becoming scuffed and lifted.

CLAIMS:

(1) A floor covering element comprising a layer of a floor covering material having an upper surface defining a suitable surface for receiving the feet of a person walking on the element and a lower surface for resting on a support surface, characterized in that there is provided a plurality of mechanical fastener members each having a head portion attached to and carried by the floor covering material prior to the attachment thereof to the support surface and a sharp attachment portion projecting downwardly therefrom for penetration into the support surface.

(2) An element according to Claim 1 wherein the upper surface includes textile fibres.

(3) An element according to Claim 1 wherein the head portion is attached by adhesive means to the floor covering material.

(4) An element according to Claim 3 wherein the adhesive means comprises a layer of a film material with said sharp attachment portion projecting through said layer and said layer adhesively attached to the lower surface.

(5) An element according to Claim 3 wherein the adhesive means comprises a first layer of a film

material positioned between said head portion and said lower surface and a second layer of film material with said sharp attachment portion projecting through said second layer, said second layer being bonded to said first layer and said first layer being bonded to said lower surface such that the head portion is confined between the first and second layers.

(6) An element according to Claim 5 wherein the first and second layers are formed of a heat actuatable adhesive material and wherein there is provided a third covering layer overlying said second layer with said sharp attachment portion projecting therethrough.

(7) An element according to Claim 1 wherein each mechanical fastener member comprises a staple having a head portion and two parallel sharp attachment portions extending from the head portion.

(8) An element according to Claim 7 wherein the floor covering element comprises an elongate strip of said floor covering material and wherein the staples are arranged such that the elongate head portion thereof lies transverse to the longitudinal axis of the strip.

(9) An element according to any one of Claims 1 to 8 wherein the textile floor covering material comprises a textile material formed from needle punched

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layers of textile fibres.

(10) A floor covering element for use with a decking plank characterized in that it comprises an elongate narrow strip of a floor covering material having a width substantially equal to a width of the plank, and means carried by the strip for attachment of the strip to the plank.

(11) An element according to Claim 10 wherein said attachment means comprises a plurality of mechanical fastener elements each having a head portion and a sharp attachment portion projecting downwardly therefrom for penetration into the plank, the head portion being fastened to the strip by adhesive means.

(12) An element according to Claim 11 wherein the adhesive means comprises a layer of a film material with said sharp attachment portion projecting through said layer and said layer adhesively attached to the lower surface.

(13) An element according to Claim 11 or 12 wherein the adhesive means comprises a first layer of a film material positioned between said head portion and said lower surface and a second layer of film material with said sharp attachment portion projecting through said second layer, said second layer being bonded to said

first layer and said first layer being bonded to said lower surface such that the head portion is confined between the first and second layers.

(14) An element according to Claim 11, 12 or 13 wherein the first and second layers are formed of a heat actuatable adhesive material and wherein there is provided a third covering layer overlying said second layer with said sharp attachment portion projecting therethrough.

(15) An element according to Claim 11 wherein each mechanical fastener member comprises a staple having a head portion and two parallel sharp attachment portions extending from the head portion.

(16) An element according to Claim 15 the staples are arranged such that the elongate head portion thereof lies transverse to the longitudinal axis of the strip.

(17) An element according to any one of Claims 10 to 16 wherein the textile floor covering material comprises a textile material formed from needle punched layers of textile fibres.

(18) A combination of a decking plank and a floor covering material thereon, the combination comprising an elongate plank of a wooden material of generally rectangular cross section including two wider sides and

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two narrower sides, an elongate strip of floor covering material, and means attaching the floor covering material to one wider side of the plank such that the floor covering material covers said one wider side with at least a portion thereof lying in a plane of said one wider side, the other of said wider sides being free from said floor covering material, characterized in that said portion of the floor covering material lying in the plane of said one wider side terminates substantially at side edges of said one wider side of the plank.

(19) A combination according to Claim 18 wherein said attachment means comprises a plurality of mechanical fastener elements each having a head portion and a sharp attachment portion projecting downwardly therefrom for penetration into the plank, the head portion being fastened to the strip by adhesive means.

(20) A combination according to Claim 19 wherein the adhesive means comprises a layer of a film material with said sharp attachment portion projecting through said layer and said layer adhesively attached to the lower surface.

(21) A combination according to Claim 19 wherein the adhesive means comprises a first layer of a film material positioned between said head portion and said

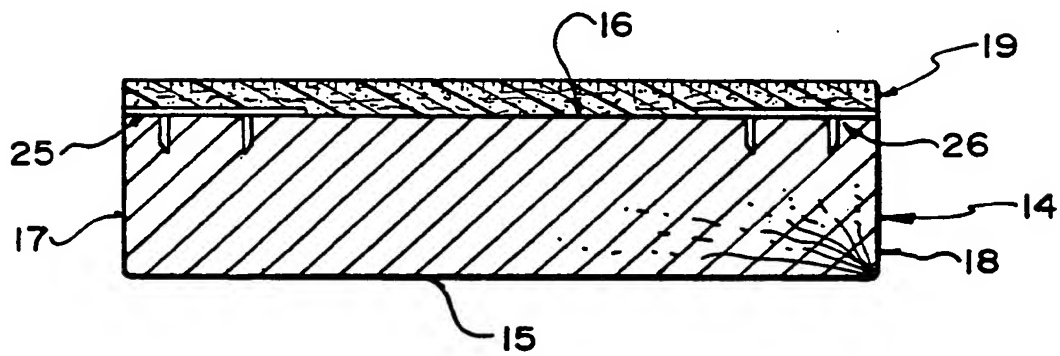
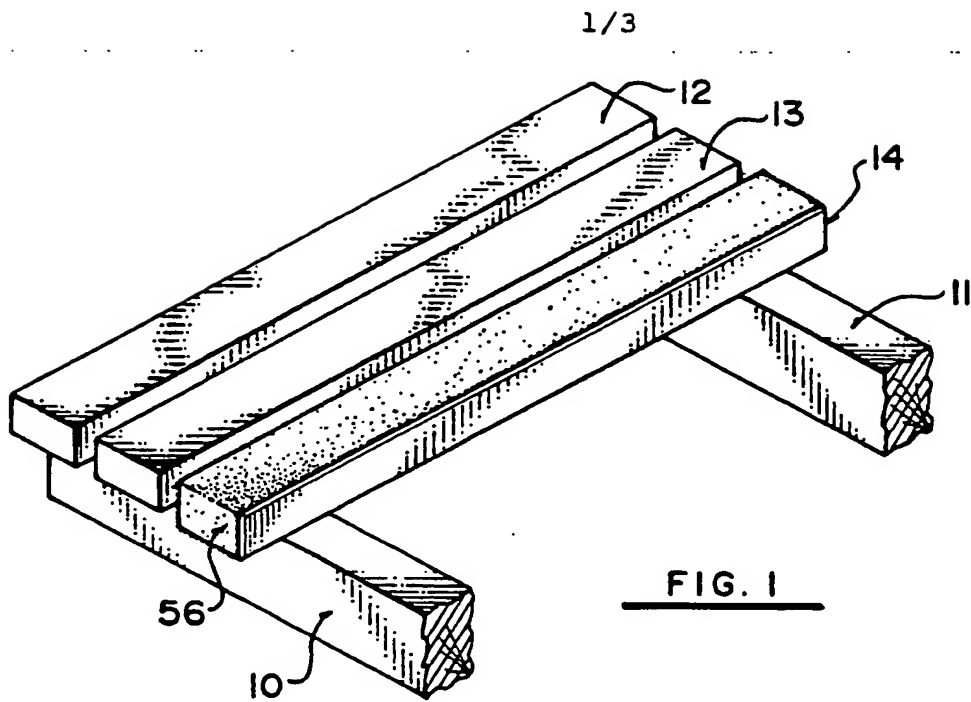
lower surface and a second layer of film material with said sharp attachment portion projecting through said second layer, said second layer being bonded to said first layer and said first layer being bonded to said lower surface such that the head portion is confined between the first and second layers.

(22) A combination according to Claim 21 wherein the first and second layers are formed of a heat actuable adhesive material and wherein there is provided a third covering layer overlying said second layer with said sharp attachment portion projecting therethrough.

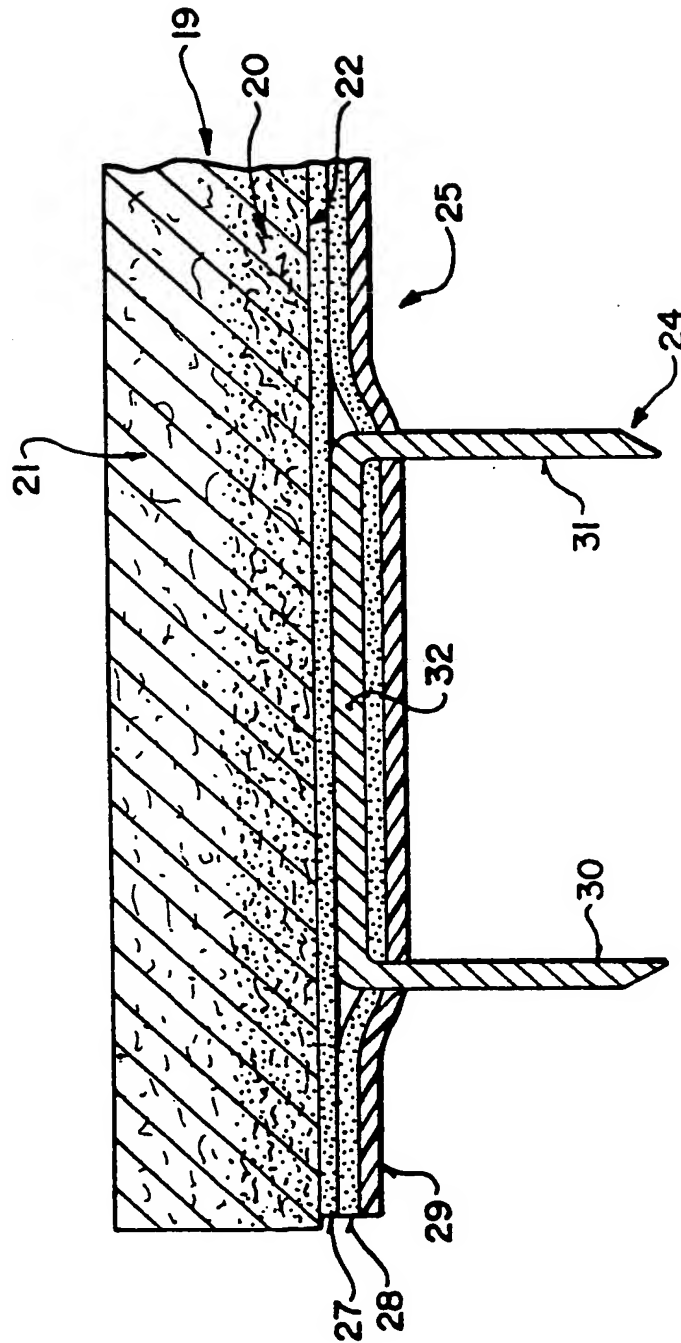
(23) A combination according to Claim 19 wherein each mechanical fastener member comprises a staple having a head portion and two parallel sharp attachment portions extending from the head portion.

(24) A combination according to Claim 23 wherein the floor covering element comprises an elongate strip of said textile floor covering material and wherein the staples are arranged such that the elongate head portion thereof lies transverse to the longitudinal axis of the strip.

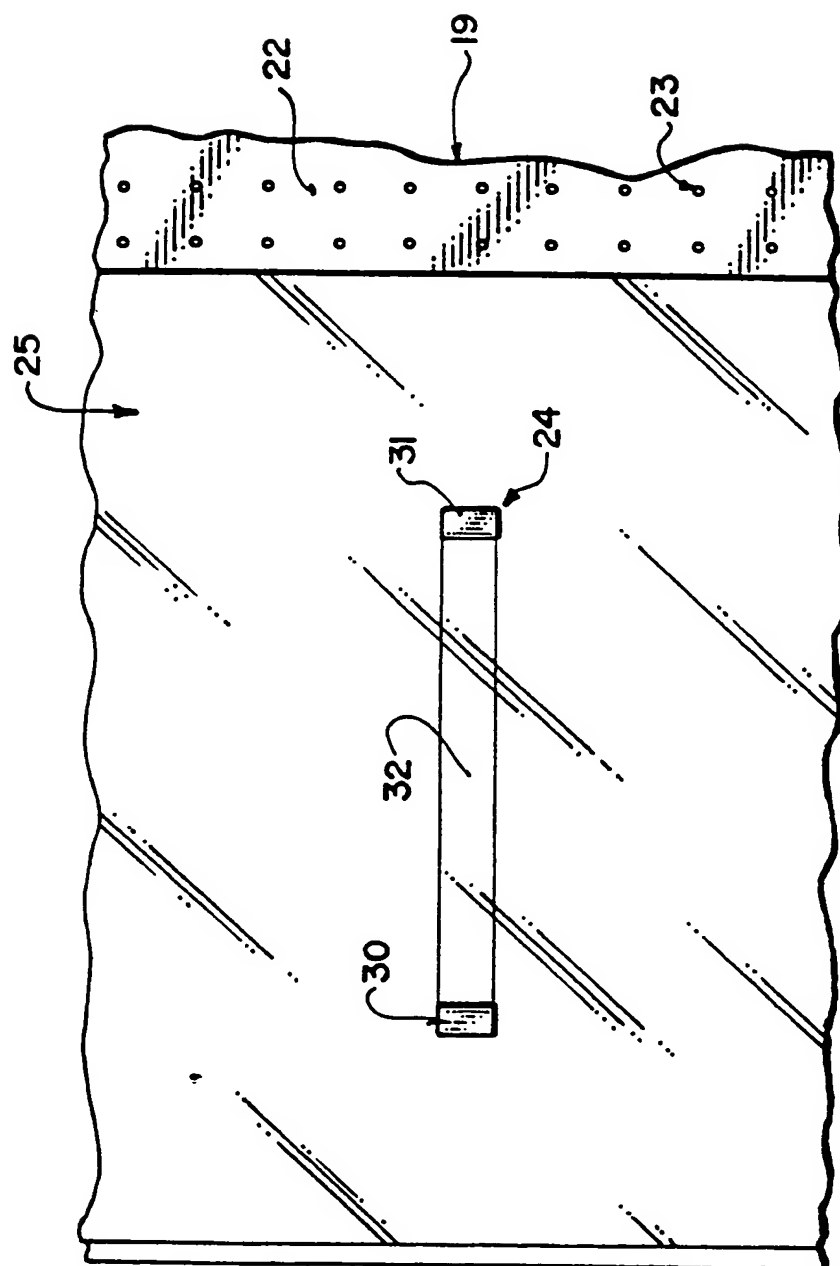
(25) A combination according to any one of Claims 18 to 24 wherein the textile floor covering material comprises a textile material formed from needle punched layers of textile fibres.



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**FIG. 3****SUBSTITUTE SHEET**

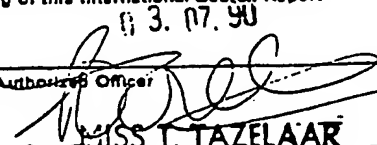
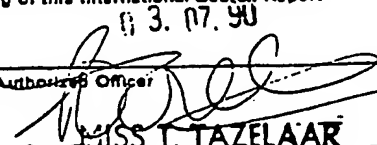
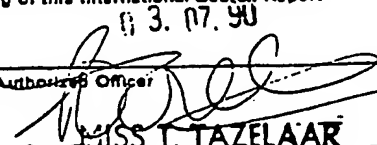
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FIG. 4

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INTERNATIONAL SEARCH REPORT

International Application No PCT/CA 90/00067

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁶ According to International Patent Classification (IPC) or to both National Classification and IPC IPC ⁵ : E 01 C 5/22, A 47 G 27/04, E 04 F 15/16														
II. FIELDS SEARCHED <div style="text-align: center; border-top: 1px solid black; border-bottom: 1px solid black;">Minimum Documentation Searched ⁷</div> <div style="display: flex; justify-content: space-between;"> <div style="width: 30%; border-bottom: 1px solid black;">Classification System ¹</div> <div style="width: 65%; border-bottom: 1px solid black;">Classification Symbols</div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 30%; border-right: 1px solid black; padding-right: 5px;">IPC⁵</div> <div style="width: 65%; padding-left: 5px;">E 01 C, A 47 G, E 04 F</div> </div> <div style="border-top: 1px solid black; padding-top: 5px; margin-top: 10px;"> Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸ </div>														
III. DOCUMENTS CONSIDERED TO BE RELEVANT ⁹ <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th style="width: 10%; text-align: left;">Category ⁹</th> <th style="width: 70%; text-align: left;">Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²</th> <th style="width: 20%; text-align: left;">Relevant to Claim No. ¹³</th> </tr> </thead> <tbody> <tr> <td style="text-align: center; vertical-align: top;">A</td> <td style="vertical-align: top;">FR, A, 2393108 (RHONE-POULENC-TEXTILE) 29 December 1978 see figures --</td> <td style="text-align: center; vertical-align: top;">1,10,18</td> </tr> <tr> <td style="text-align: center; vertical-align: top;">A</td> <td style="vertical-align: top;">FR, A, 2282999 (GOTTLIEB BINDER) 26 March 1976 see figure 2 --</td> <td style="text-align: center; vertical-align: top;">1,10,18</td> </tr> <tr> <td style="text-align: center; vertical-align: top;">A</td> <td style="vertical-align: top;">GB, A, 2192336 (JAC TAC INC.) 13 January 1988 see abstract -----</td> <td style="text-align: center; vertical-align: top;">1,10,18</td> </tr> </tbody> </table>			Category ⁹	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³	A	FR, A, 2393108 (RHONE-POULENC-TEXTILE) 29 December 1978 see figures --	1,10,18	A	FR, A, 2282999 (GOTTLIEB BINDER) 26 March 1976 see figure 2 --	1,10,18	A	GB, A, 2192336 (JAC TAC INC.) 13 January 1988 see abstract -----	1,10,18
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A	FR, A, 2282999 (GOTTLIEB BINDER) 26 March 1976 see figure 2 --	1,10,18												
A	GB, A, 2192336 (JAC TAC INC.) 13 January 1988 see abstract -----	1,10,18												
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>¹⁰ Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"A" document member of the same patent family</p> </div> </div>														
IV. CERTIFICATION <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <tr> <td style="width: 50%; padding: 5px; vertical-align: top;"> Date of the Actual Completion of the International Search <div style="text-align: center;">6th June 1990</div> </td> <td style="width: 50%; padding: 5px; vertical-align: top;"> Date of Mailing of this International Search Report <div style="text-align: center;">3. 07. 90</div> </td> </tr> <tr> <td style="width: 50%; padding: 5px; vertical-align: top;"> International Searching Authority <div style="text-align: center;">EUROPEAN PATENT OFFICE</div> </td> <td style="width: 50%; padding: 5px; vertical-align: top;"> Signature of Authorised Officer <div style="text-align: center;">  MISS T. TAZELAAR </div> </td> </tr> </table>			Date of the Actual Completion of the International Search <div style="text-align: center;">6th June 1990</div>	Date of Mailing of this International Search Report <div style="text-align: center;">3. 07. 90</div>	International Searching Authority <div style="text-align: center;">EUROPEAN PATENT OFFICE</div>	Signature of Authorised Officer <div style="text-align: center;">  MISS T. TAZELAAR </div>								
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CA 9000067

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 26/06/90. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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